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WHOLE No. 214. FRIDAY, MAY 19, 1837. [MONTHLY, 54.

For the Mechanics' Magazine.

AN IMPROVEMENT IN THE CONSTRUCTION OF CHIMNEYS.

I have thought that an improvement would be made in the construction of chimneys, by building the flues circular instead of square. By a plan which I shall describe, the inside of the flues might be made much smoother with less trouble than the square ones are now made, and might be carried up with less variation in the size.

My plan is, to mould brick clay into pieces about 24 or 30 inches long (or any length most convenient in using,) about two inches thick, and shaped like half of a hollow cylinder, divided from end to end. When the fire-place is built, the flue should be brought to its size in a circular form, sufficiently large for the free passage of the smoke. The outside of the chimney being carried up a few courses, two of the half tubes are to be put on as a continuation of the flue, with mortar under the ends on which they stand, and between the edges which come together. They will thus form a circular tube, which should be of the same diameter as the flue where they are put on. Where the flue bends, it will be necessary to cut the ends of the pieces, so that they will make an angle, when put together, in the same manner as the joints of a stove pipe. When the tops of the pieces come even with the outside course of bricks, they might be tied by thin pieces of iron plate, such as are used for binding the fronts of walls to the inside work. The advantages of this plan, I think, are, the flue has a shape which I believe is considered the best for carrying smoke; the inside is smoother than the square ones usually are, and it therefore presents fewer impediments to the passage of the smoke; the chimney might be cleaned easier than the square ones, for a circular brush passed up and down, by means of a rope, would sweep well and quick, and the chimney-sweep might thus be spared his labor inside of the flue. I should think the expense would not be more than that of the square flue, after the brick-maker had got the necessary tools, and had had some practice in the manufacture of the flue pieces.

If you or any of your readers are disposed to examine this plan, and show its defects, or improve it in any way, I shall be glad to read their opinions in your next, or as soon as convenient. A. H. W.

From the London Mechanics' Magazine.

NEW STEAM-BOILER.—Sir,—Having discovered a means of generating steam by a system at once exceedingly powerful, safe, of comparatively light weight and small size, I beg to call the attention of the scientific readers and others of your Journal to its astonishing power; and to state, that I am desirous of relinquishing wholly, or in part, my interest in its use. A 60-horse power-boiler will measure 2 feet 6 inches long by 1 foot diameter, and will weigh under 2 cwt.; a 600-horse power will measure 6 feet long by 4 feet diameter, and will weigh under a ton. Incredible as these results may appear, they are quite certain, and rest upon well-known principles; and is, therefore, for locomotive-engines and steam-navigation particularly, highly valuable.

I am, Sir,
Your obedient servant,
G. L. SMARTT.

Enfield.

ON CEMENTS.

A patent was granted to John Henry Cassell, of Mill-wall, for his invention of a cement or combination of materials applicable to purposes for which cement, stone, brick, or other similar substances, may or can be used.—[Sealed April 19, 1834.]

This invention consists in cementing or combining the materials for making roads, and for constructing docks, water-courses, foundations, and other similar works, by the aid of coal or other mineral tar, wood tar, and resinous matters, or the products of tar, in the manner hereafter described; and thus producing a mass, which may be formed or moulded into any figure, which, when cold, will be exceedingly hard, and be serviceable for the purpose of cement, stone, or brick, in constructing any such like works or buildings, as before mentioned. But in order that this invention may be perfectly understood and carried into effect, it may be necessary to describe the methods used by the Patentee for combining such materials together, and applying them to the aforesaid purposes. A quantity of tar, such as is produced by the distillation of coal, shale, or wood, is first taken, and by further distillation the aqueous parts are separated therefrom, and thus the tar or resinous substance is reduced to the consistency of treacle; this is called the first product, the tar or resinous substance being in a thick and adhesive condition when cold. In order to produce the second product, the distillation is carried on still farther, and by this means the essential oil is obtained; and for the third product, the process of distillation is carried on, till the substance becomes so adhesive, that a small portion being removed from the still may be drawn out into threads, and when cold, becomes brittle; and for the fourth product, the distillation is carried on still farther, till the substance becomes extremely hard, and will not soften by heat, either of the sun, or any artificial heat. The apparatus or still which is used for this purpose, is similar to that which is called a pitch still, which is well known, and forms no part of this invention, nor does the process of distillation for separating the tar into three products; that is to say, first, tar deprived of the aqueous parts, and reduced to a thick adhesive condition when cold. Secondly, the essential oil. Thirdly, the adhesive tar, or product thereof, which when cold, is hard; and fourthly, the substance not acted on by the heat of the sun. It may be desirable here to remark, that coal tar is preferred, in consequence of cheapness.

The Patentee then proceeds to describe the combining of these products with other materials, in forming a cement or combination in the making of roads, docks, water-courses, and such like works. We will first describe the method pursued in applying this invention to the making of roads, or in repairing them. Having laid out the road, and made the necessary drains for preventing the lodgment of water below the road, the surface is prepared by beating or rolling, in order to compress the earth, particularly when the surface is composed of loose earth, and, by raking, bring the surface to the required figure, that is, with such slopes as may have been determined upon, and make the same as even as possible. The surface is then saturated with the essential oil, (the second product,) in thin layers, allowing time for it to subside. The oil put on in this manner will quickly penetrate the ground: the second operation is then commenced, which consists of spreading over the surface of the earth so prepared a thin coating of the first product, perhaps one-fourth of an inch thick, then let the same be ignited, and permit it to burn a short time. Dry sand, or fine dry earth, or slag, or cinder, or a combination of these, should then be sifted on the tar and oil, to the depth of about half an inch, which will instantly put out the flame. The ground should then be rolled, in order to cement the tar and sand together; and, in order to facilitate the operation, it is found desirable to have a frame of iron, or other material, about three feet square, which is successively placed over the surface of the ground, and thus complete portions of the surface at each operation. By this means, it will be evident that a thin cemented layer or surface will be produced on the road. In some instances, one, two, or more layers of this description may be made on the road, depending on the extent of trafic to which it is to be subjected; but it will be desirable to remark, that the essential oil is only used previous to the first layer. Having thus prepared the under surface of the road, the Patentee proceeds to describe in what manner the same is finish-

ed; and observes, that the finishing materially depends on the description of materials, which may be readily obtained at the place where the road or other work is being constructed, such as broken granite, flint, slag, gravel, or any other hard material suitable for the surface of a road. It should be observed that the same should be broken somewhat small, say not larger than three inches, and one-third of the third product should be taken to two thirds of sand, and boil and mix them together; then pour such mixture over the broken materials to the desired depth, which running into the space between the stones, forms a very hard and solid mass when it cools. When the said fourth product is in a melted state, any of the materials, such as sand, stone. &c., may be mixed in an open vessel, in the proportion of one-third of the fourth product to three of stone, sand, &c., by weight, and mix them well together; and when so mixed, the composition is spread over the surface of the road from one to four inches deep, or more if it is thought necessary, the road being prepared as before described; this is then rolled so that as even a surface as possible will be produced; by which means a hard surface will be formed, which will wear exceedingly well, and produce a cheap and lasting road. Or where it is desired that the upper surface should be formed of larger stones, or other material, such as broken granite, flint, slag, or other substances, of a size such as is generally used in making what are called Macadamized roads, frames or moulds may be used from twelve to forty-eight inches square, open at top and bottom, like a brick mould; pack in them a number of such broken pieces of material, and then run in a quantity of the fourth product in a melted state, and then fill up the interstices between the stones or other materials, making the upper surface as even as possible. These materials, when left in the moulds till they are cold, will be stronly cemented together, and be ready to form the upper surface of the road, they should be put on in the following manner: having prepared the road, as above described by the essential oil, with the first product, and the sand or fine earth, a coat of the third product of the tar should be spread over to about the thickness of one inch; then, while the third product is warm, cover the road with the moulded materials, placing that part which was uppermost in the act of moulding, on the surface of the road prepared as above, and by rolling or pressing, cause the moulded parts to adhere firmly together, by this means, rather a rough surface will be produced, suitable to the tread of a horse. The first preparation is also used to cover good Macademized or other roads, which firmly cements every stone into its place, prevents the wheels from ploughing up the roads, the water from softening the substrata, and preventing mud and dust from rising. The third product is also used, when in a melted state, to pour between the joints of street pavement, in the manner that grouting is now performed: this will cement every stone together, and so prevent water from getting beneath the stones to the sub-soil, or rising therefrom. If the sub-stratum is of a soft substance, or the street is required to be very durable, the ground is first prepared, as described in the first process: the paving stones are then saturated with essential oil, and the third product is then run between the joints of the stones or bricks that are required for foundations. The resin of wood is used for making stone and cast figures, that are required to be of a yellow color; sand of the required color is added, as in the fourth process. In some instances, instead of moulding such larger pieces of flint stone, or other material, sand, or fine earth, is mixed with the fourth product when in a hot and melted state, and the composition is moulded, as above described: such materials being very suitable for foot paths, water-cisterns, pipes, and a variety of other useful purposes.

Having thus described the nature of the invention, as applied to roads, the Patentee proceeds to describe its application to canals docks, water-courses, and such like works. The earth being excavated, and the slopes of the banks made to the intended figure, the next process is to beat the surface of the earth; and in order to render the same as compact as possible, it is saturated with the essential oil, as before described; then a thin layer of the first product of the tar is run over and ignited; after that, sand, or any other dry earth or material, is sifted over, as above described. Three layers of these cemented materials will be sufficient when applied to the usual slopes for canals and water-courses, and will offer a compact and close surface to the water; which will protect the banks from the prejudicial washing to which they are otherwise subject, and consequently be of great utility when quick travelling is required, or when the canal

boats are propelled by machinery. In forming the embankments of docks or quays requiring steep or perpendicular walls, a much stronger facing is required, depending on the depth of the water they are to support, and also the description of ground behind.

The Patentee proceeds to state that a framing of wood is usually constructed to the desired thickness; and having previously made a good base or foundation of a combination of the fourth product of the tar, with broken stones, or other rough hard materials, and sand or earth, he continues melting and mixing quantities of the fourth product of tar with broken stones and sand, in the proportion of about one of the fourth product to three of the stones and sand, or other material, and successively throws them into the frame, and levels and beats such concrete mixture, till the frame is quite full to the surface of the intended finish of the wall, which is usually made to lay on the surface of the earth. It would be advisable to remark, that between each quantity of the material thus put into the frame, it is found desirable to spread over a thin coat of the first product of the tar, and ignite the same, in order that the surface of the last quantity should be in a melted state, to receive the next quantity of the material. It will be evident, from the above description, that piles, and also landties, may be built in the walls, in order to give additional strength to them; and that where frames or mounds are used, they are washed over with a covering of white-wash or of clay, by which means the composition does not adhere to them.

The Patentee concludes by saying, that having thus described the nature of his invention, and the manner in which the same is performed, he would have it understood that he does not claim any of the materials separately; and it will be evident that the means of carrying the same into effect, may be varied to suit the particular object to which the invention is to be applied: but he would have it understood, that what he claims as his invention, is the cementing or combining the materials for making and mending roads, and for constructing docks, water-courses, water-tanks, pipes, and such like work, by the aid of tar and resinous substances, or the products thereof, as above described.—[Lond. Jour. Arts and Sciences.]

NEW LAMP.—A lamp of a new construction, which describes a circle of light of about thirty feet in diameter, of the apparent intensity of sunshine, showing the objects within its sphere as distinctly as on the table of a camera obscura, has been erected at the head of the inclined plane in St. Leonard's depot. Its object is to enable the engine-man to a distinct view of the inclined ropes during the night, and this has been fully attained. The lamp consists of an Argand burner, placed in the focus of a large speculum, of a peculiar form, by which the whole light is distributed just on the spaoe where it is required. It is computed that the light on the above space is equal to that of twenty-five or thirty similar burners in common lamps. A lamp of this kind we have no doubt would be useful for other purposes. It appears to us that the largest assembly-rooms might be brilliantly lighted by one placed at each end of the room, and one would be sufficient to light the stage of a theatre. The cost of this one is said to be about £200 but we understand it saves an annual expense of about half that sum. The inventor is a Mr. Rankin, and he names it the conoidal lamp, probably because the light is thrown from it in the form of a cone.—[Caledonian Mercury.]

From the London Mechanics' Magazine.

ON A PECULIAR VOLTAIC CONDITION OF IRON, FIRST NOTICED BY PROFESSOR SCHOENBEIN, OF BALE.

Sir,—The facts contained in the present communication, are not to be understood as laying claim to originality in their leading principles; some of the experiments, however, that I shall have occasion to describe, have never been made, or at any rate, I have never seen any account of them by any one else, and the whole are so extraordinary, and will, in my opinion, eventually throw such light on the rationale of Voltaic action, that I think you will not object to give them publicity through the medium of your Journal. In the *London and Edinburgh Philosophical Magazine*, vols. ix. and x., may be found the original papers of Professor Schoenbein and Dr. Farady. All the experiments there described, I have attentively gone through, and I shall merely give here such an abstract of them as may be necessary to set the matter clearly before your readers.

Ex. 1.—When iron wire, $\frac{1}{16}$th of an

inch in diameter, was immersed in nitric acid, specific gravity 1.379, it was attacked with violence; but when surrounded, or even touched in the acid by a piece of platina wire, action was instantly stopped. The platina was then removed, and the wire remained for any length of time in the acid without any action, and as bright as silver. If it was now taken out, wiped, and again immersed, violent action immediately took place for a moment, but it soon (generally) was again quiescent.

Ex. 2.—If, when the wire was in violent action, it was touched by a piece of platina, the effervescence instantly ceased, but again commenced when the platina was removed. Bringing the two metals a second time into contact effectually stopped the action. If the wire was in a very violent state of effervescence, it was not for some time protected by the platina.

Ex. 3.—If a wire made thus inactive by platina, was touched in the acid by a piece of zinc, or a common iron wire, it was thrown into action: but an iron wire having the smallest piece of platina attached to it, did not throw it into action, being itself inactive. If the platina was now slipped off, and either wire touched once with a common wire, both were instantly thrown into violent action.

Ex. 4.—When the acid was disturbed with an equal bulk of water, platina did not preserve iron wire from its action, even when coiled thickly round it; it appeared, indeed, rather to quicken the action. But though it did not preserve it under these circumstances, it did under others which I shall notice presently.

Ex. 5.—Half a wire, four inches long, was heated to dull redness, the blue tinge extended through three inches when the wire was cold, and these three inches were quite inactive in acid specific gravity 1·379, he other inch was active; when the heated end was made bright by filing, it was rendered active, showing the former inactivity to be owing to the superficial coating of oxide.

Ex. 6.—When a wire made indifferent to nitric acid by platina was immersed in the acid, and another common wire dipped into the same vessel, the latter was of course active; but when the wires were made to touch at their parts *above* the liquid, action was excited in the indifferent wire.

Ex. 7.—A common wire was made to touch an indifferent one, and both dipped into the acid, the *indifferent* one going in *first*. By this means, the common wire was made indifferent, not being in the slightest degree acted on by the acid; the second wire rendered indifferent a third, the third a fourth, and so on. This experiment succeeds best with wire that has been made indifferent by platina, but with care it will answer equally well with wire that has been made indifferent in the fire; the conditions appearing to be perfect contact, and gradual immersion. When these wires were taken out of the acid and wiped, they always returned to the active state, but were again made indifferent by repeating the process.

Ex. 8.—A wire, polished very bright, was protected by platina, and immersed in a solution of nitrate of copper, and nitric acid, which acted very strongly on common iron, copper being deposited on the metal: the protected wire *remained, however, bright.* After remaining a few seconds the platina was removed, the iron instantly became as common iron, but when the platina was allowed to remain in contact an hour or two, and then removed, the wire was left in the peculiar state, exhibiting the curious phenomena of a piece of polished iron being quite inactive in a solution of nitrate of copper and nitric acid. The wire thus inactive, on being touched by a piece of common wire was instantaneously rendered active, undergoing rapid solution, and becoming covered with a crust of copper.

Ex. 9.—A piece of iron was protected by a piece of platina, and immersed in nitric acid; the platina was then withdrawn, the iron remaining in the peculiar state. A piece of common iron was then bent into a fork, and slipped down the inactive wire into the acid, by which it was itself rendered inactive. Now if another piece of iron was made to touch the fork *before* being introduced into the acid, it was rendered itself inactive; but if it was first thrown into action, and then made to touch either end of the fork, it threw all the wires into action. This is rather different from the result obtained by Professor Schoenbein. He describes that end of the fork that was touched, being *alone* thrown into action, the other remaining in the peculiar state as long as

the first wire was kept in contact with the bend, but when that was removed both ends became active. The Professor's experiment was made with an oxydised wire. I found it difficult to reduce the fork to the peculiar state with such a wire, but when I accomplished it the phenomena were similar to those just described. I should much wish this experiment to be tried by others, as I am at a loss to understand whence this disaccordance should arise.

Ex. 10.—When an active wire was connected with one of the cups of a galvanometer, and a platina wire with the other cup, and both wires dipped into nitric acid, momentary action took place, and an electrical current was shown to pass from the iron to the platina through the fluid, the latter metal becoming positive, but the action soon ceased, the platina protecting the iron, though not in actual contact with it; when chemical action was stopped, the electrical current was stopped also.

Ex. 11.—When the iron wire was connected *first* with the galvanometer, and the circuit completed by putting it into the acid, the platina wire having been previously arranged, no action, either chemical or electrical, took place. The same was the case if a wire, having been previously made inactive, was substituted for the platina. Now when platina was used, the moment the circuit was closed, bubbles of gas made their appearance on the platina, and if an iron wire was used, having a small piece of platina foil or wire attached to it, the bubbles formed on all parts of the foil, but none made their appearance on the iron. If then the platina foil was removed, the bubbles made their appearance on the iron, which sometimes also went slightly into action.

Ex. 12.—When two cups were employed, being connected by a compound platina and iron wire, all the phenomena which took place in a single glass were observed, and the platina or inactive iron in one glass, exerted a protecting influence on the iron in the other, provided the communication was first made through the galvanometer; a touch from a common wire also threw the iron into action, producing a strong electrical current. The same was the case with three or four glasses connected by a compound wire.

Ex. 13.—When the acid was diluted, so as to have a specific gravity 1·204, platina, as was before observed, could not protect iron from its action; neither when connected with the galvanometer did it, if the iron was dipped in the acid first; but if it was first connected with the galvanometer, and then put into the acid, no action whatever took place in any length of time; on removing the platina, action sometimes took place; it always commenced when the inactive wire was once touched in the acid with an active wire, or with a piece of copper. The wire, thus made inactive, did not possess the power of rendering other wire inactive, but was always thrown into action itself. When a piece of common iron was substituted for the platina, whether it was connected with the galvanometer first or not, the wire in this case acted as platina to the second.

Ex. 14.—When two cups were employed, and connected by a bent piece of wire, and so arranged that the iron wire should be active, on removing the connecting wire, and taking a fresh piece, if it was dipped first into the cup containing the iron, and the other end brought into the platina cup, *that end was in the peculiar state*, and there was no passage for the electrical current, the needle of the galvanometer being quiescent; but when it was put into an active state the electrical current passed. Now here we have the iron made inactive *without any metallic communication with the platina*, and when inactive it is found incapable of conveying a current of Voltaic electricity; an inactive wire could not, in this experiment, be substituted for the platina. This latter most remarkable, and, as I believe, at present, inexplicable fact, has, as far as I know, never before been noticed, but that it is true, any one may in a few minutes convince himself. I have often left the whole arrangement undisturbed for hours, and still, at the end of that time, the end of the connecting wire in the platina cup has been *perfectly bright*, and the needle of the galvanometer stationary in its usual position; but on touching it once with a common wire, it has been thrown instantaneously into action, and then the electrical current has passed, the needle being strongly deflected. I am, at present, occupied in further researches, and I hope something satisfactory in explanation of this dark subject will soon transpire.

I am, Sir,
Your obedient servant,

Near Bath, March 15, 1837.

IMPORTANT EXPERIMENTS WITH CANAL BOATS AT HIGH VELOCITIES.

We extract from the *Edinburgh Advertiser* the annexed account of some experiments, which prove that high velocities are attainable by properly constructed vessels, upon canals, or narrow waters, without raising a great wave, and consequently injuring the banks;—

"We regard the experiments described below as extremely important. If the result is correctly stated, and if no counteracting disadvantages has escaped notice, we think these experiments may be said to have added a million sterling to the value of canal property in Great Britain, since they must, at no distant period, add fifty or a hundred thousand pounds to the annual dividends. Nothing can be more paradoxical or startling in appearance than this result; and yet our knowledge of the many unexpected truths in mechanical science which experiment has brought to light, will not permit us to reject it as incredible.—It is this:—*that the surge generated in a canal by the motion of a boat, and which is so destructive to the banks, in moderately rapid motion* (such as four or five miles an hour,) *ceases altogether when a high velocity is employed.* It is true the vessels were of a particular construction, but this is immaterial. A boat sixty feet long and six feet wide, is capable of being extremely serviceable, both for the conveyance of goods and passengers; and if a boat be safely and conveniently dragged at the rate of nine or ten miles an hour upon our canals, passengers by this species of conveyance will then be upon a level, as to speed, with those who travel per mail. The great recommendations of canal carriage at present are, its cheapness, and the liberty of locomotion which passengers enjoy. Its leading disadvantage is its slowness; and this is now felt more and more, when our stage coaches are touching a speed of ten miles an hour, which will soon be doubled on our railways. We have not technical skill enough to know what a gig-boat is; but we infer from the other particulars stated, that it must be flat-bottomed in the cross section, pretty well curved upwards at stem and stern, and very light. With this form, the quicker it is moved, the less water it will draw. At a very high velocity, it will merely skim the water as it were; the displacement of the fluid will reach only a few inches down; and this circumstance, with the quick motion of the boat, causing a readjustment of the equilibrium of the water equally rapid, the necessary time will be wanting for the motion to propagate itself beyond the narrow zone of water which immediately encompasses the boat. Such is our hypothesis, supposing the fact to be as stated. We have a strong impression however, that the result depends chiefly on the form of the boat, and that a much greater depth than five feet will be no material disadvantage except where the canal is extremely narrow.

"Some months ago, by the suggestion of Mr. William Houston, of Johnstone, the committee of management of the Ardrossan and Paisley canal were induced to make certain experiments for ascertaining the rate of velocity at which a light gig-boat might be propelled along that canal. Tho experiments were made with a gig-rowing boat of about thirty feet in length, constructed by Mr. Hunter, boat-builder, Brown-street, Glasgow; and this boat with ten men on board, was drawn along the Ardrossan and Paisley canal, in the space of less than ten minutes, without raising any surge or commotion on the water—the force employed being one horse, rode by a canal driver. No account of this trial has ever been given to the public, but it was so satisfactory as to induce the committee of the Ardrossan canal to contract with Mr. Wood, of Port-Glasgow, for a gig-shaped passage-boat, sixty feet in length, and five in breadth, fitted to carry from thirty-six to forty passengers. In the month of April last, a number of experiments were made in the Forth and Clyde canal with two gig-boats fixed together, constructed by Mr. Hunter, and thus forming what is called a twin-boat. The object of these trials was to ascertain the rate of speed at which vessels might be propelled along that canal, and the effect of a light double or twin, boat, in giving that degree of steadiness which it was apprehended would be so much wanting in a light single boat. A statement of these experiments on the Forth and Clyde canal has already appeared in the newspapers, and the only fact therein mentioned, which it seems necessary to repeat here, is the remarkable

circumstance, that the quicker the boats were propelled through the water, the less appearance there was of surge or waves on the sides of the canal. The result of the experiments was so satisfactory, that a twin boat of a gig shape, sixty feet in length, and nine feet broad, was built by Mr. Hunter, Brown-street, Glasgow, and launched in the Forth and Clyde canal, in the course of the following month.

"The single gig-shaped passage boat contracted for by the Ardrossan canal committee, was launched at Port-Glasgow, on Wednesday, the 2nd of June, and she was towed up to the Broomilaw, and thence carried to Port-Eglington the day following; and on Friday, the 4th of June, a trial, of which the following is an account, took place. The boat is sixty feet long, four feet six inches breadth of beam, and drew on an average, including a deep keel, ten inches when light :—

"From the great hurry in which this trial was made, it was done under many disadvantages. The boat started from Port-Eglington for Paisley, a few minutes after one o'clock, with twenty persons on board, and the distance from Port-Eglington to Paisley being seven miles, was accomplished in one hour and seven minutes. The rider was ordered to start and proceed the first mile or so at a very moderate pace but even at this moderate pace the wave raised in front of the boat was very considerable. A high wave was seen on the canal preceding the boat, about eighty or ninety feet in front, and in some cases farther, and causing an overflow at the bridges and in the narrow parts of the canal. The surge or the cutting wave behind the boat was, however, comparatively slight, and except, the curves, would not have caused much injury to the canal banks. The horse was very much exhausted when he got to Paisley, though by no means so exhausted as he was about the middle of the journey, having sensibly recovered after the first four or five miles.

"Two post horses were hired there; and lighter towing lines being attached to the boat, it started again, on its return to Glasgow, with twenty-four persons on board, four of whom were boys, and arrived at Glasgow, a distance of seven miles, in forty-five minutes. The greatest speed attained during the journey, was two miles in eleven minutes. During this voyage the surge behind was entirely got quit of, even at the curves, where it was reduced to nothing; and there was no front wave except at the bridges. It appeared only at the bridges, and just as the boat was about to enter under the bridge, and disappeared as the stern of the boat cleared the bridge. *The quicker the boat went the more entire was the disappearance of all waves and surge*, except where the water escaped in the centre of the canal, and met in two very noisy and rapid currents from each side of the boat at the rudder. This noise and rush of water was so great behind as to induce persons on board to look round expecting to see a great wave or surge on the banks of the canal, but on the banks there was hardly a ripple. The two rapid noisy currents seemed to be completely spent and exhausted by the shock of their concourse behind the boat. Here, therefore, there was no room to doubt the correctness of the reports of the Forth and Clyde canal experiments. It was not merely to be said, that the greater the speed the less the surge or wave, but it was demonstrated that, *at a high rate of speed surge and wave were done away with altogether.* Unluckily, there was no dynamometer attached to the rope, so as to ascertain whether, contrary to all theory, the strain or pull was not, equally with the wave, and the tugging labor of the two horses, lessened instead of increased, by the accelerated rate at which they drew the boat. There can be no doubt, however, that with one trained horse properly attached, the distance could be done in a period under forty minutes.—Contrary to expectation, Mr. Wood's boat was quite steady in the water, and by no means crank. It may be proper to mention that the Ardrossan canal is throughout very narrow; at the bridges, and many other places it is only nine feet broad. It has a great number of turns, and many of them very sudden.—[Mining Journal.]

Railroads in Cuba.—A company has been formed at Puerto Principe to construct a railroad from that to Neuvitas, sixteen leagues distant. Estimated cost, one million of dollars. The engineer is Mr. Edward Huntingdon, from the United States.

From the London Mechanics' Magazine.

EFFECT OF HIGHLY-HEATED METALS ON THE GENERATION OF STEAM—COLORED WATER.

Sir,—My attention having been drawn to the very curious inquiry, which is detailed by Mr. Tomlinson, of Salisbury, in your Number of January 28th, I would beg to make a few remarks thereon.

It appears from the results of Mr. T.'s experiments, as also from his extracts from Pouillet, Baudremont, and Laurent, that a globule of water, when contained in a metallic vessel, evaporates in a shorter time, if the vessel be at or about 212 degrees, than if it have a higher temperature. This is very remarkable, and far removed from the common ideas on the subject; but I cannot assent to Mr. T.'s explanation, so far as regards the existence of a stratum or bed of steam between the vessel and the water.

We all know that the specific gravity of steam is less than that of air, and infinitely less than that of water. On what principle, then, can a portion of steam exist *beneath* the water? Let us take the analogy of any fluid whatever, and see how far it will bear out the objection.

If we have a vessel of water in process of heating over a common fire, the first formation of steam takes place at the bottom. This *ascends* to a higher stratum of water, and is then condensed and imparts its caloric to the watery particles with which it is immediately surrounded. It is this which so rapidly heats water, for the *conducting* power of water is exceedingly limited.

We constantly observe that the rapidity with which the bubbles of vapor rise to the surface is proportionate to the heat of the water. Now, let us apply this to the case of the heated crucible. Mr. Tomlinson supposes the existence of a stratum of steam under the globule of water, which retards the transmission of heat from the metal to the water; but why should not the law of specific gravity remain in force at high temperature? Why should not the steam—its expansive tendency being still more increased by its high tension—why should it not have the power of darting upwards through the watery globule, in order to gain the level of a lighter atmosphere? We must recollect that the steam is formed from the globule itself, at the lower part of it; and ought, if it exist at all, to ascend to the upper part of the globule, just as the steam-bubbles in a common kettle of water do.

I feel more inclined, of the two opinions, to choose that which attributes the slow evaporation of the globules of water to the rapid passage of heat through it. Extraordinary as such a hypothesis may at first appear, yet we have analogies in physical science which aid such a conception.

A pane of glass, broken by a pistol bullet, is not so much shattered as when broken by a stone moving with perhaps not one-tenth the velocity. If a card be balanced horizontally on the end of the finger, and a shilling placed on it, and if the card be struck sharply on the edge, it will slide away from under the shilling, leaving the latter on the finger; but if it be struck more softly, both card and shilling will fall.*

It would appear that *transparency* consists in a perfect facility in the progress of light, through the pores of any substance. Now, if we suppose that heat is *material*, we may conjecture that the calorific tension, when the vessel is highly heated, is sufficient to overcome the reluctant conducting power of water, and that it darts through the latter by virtue of the velocity acquired by such tension.

I do not wish to give this opinion the air of a theory, but there is one remark of M. Laurent's, quoted by Mr. Tomlinson, which I should much wish to see the basis of a series of experiments; he says that when he used colored water instead of transparent, the water evaporated much more rapidly.

Now, to those readers of your excellent Journal who have facilities of making such experiments, I would beg to observe, that it would be very desirable to know whether a given quantity of water, at a given temperature, evaporates in a shorter time when *colored* or *black*, than when transparent.

Black we know to result from the ab-

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* The acknowledgment of such a principle is conveyed in the story of the Turkish headsman, who was so dexterous in the use of his scymeter, that he could cut through the neck of a culprit *without disturbing the head*, when he moved his scymetar with great swiftness.

sorption of all light and colors from that of some of the rays. Now should we find that blackened water absorbs more heat, or absorbs heat more quickly, than transparent water, it would permit some evidence of the analogy between light and heat, and would also assist us in determining whether the rays of heat from an excessively heated vessel do really pass through the water too rapidly to impart much of their influence to it during the passage.

Professor Leslie made some very accurate experiments on the comparative absorptive power of different substances for heat, but I am not aware whether they extended to water differently colored.

Whether metals and water become, at a high temperature, electrically excited with the same kind of electricity, and so repel each other, we cannot at present say; but should such turn out to be the fact, it might furnish us with a reason why the globules of water appear not to be in contact with the heated metal: but be this as it may, it would assist us in the solution of this interesting question, if we could determine whether the same apparent repulsion exists between the metal and *colored* or *blackened* water, as between it and pure colorless water.

At all events, I can scarcely subscribe to Mr. Tomlinson's opinion, that a bed of *steam* exists between the water and the globule.

Your obedient servant,

D.

From the London Mechanics' Magazine.

MR. SIEVIER'S PATENT CAOUTCHOUC CORDAGE.

Sir,—In consequence of a letter which appeared in your valuable journal respecting Mr. Sievier's "patent rope," and the strictures thereon by your correspondent Many-points, I was induced to procure a piece of the said rope from the Company's establishment at Tottenham, prepared and manufactured according to the directions given in the specification by the patentee; it measured 4 feet 6 inches long, and was $\frac{3}{4}$ths of an inch in diameter, composed of 12 strands, each strand had a slip of India-rubber in its centre. This was placed in the garden in a northerly aspect, and allowed to remain exposed for two nights and days to a frosty atmosphere, uncovered, the thermometer being at the time at 29°. When removed early on the third morning from its Siberian situation, it was found to be pliable and elastic, and its length was the same.

A similar piece was immersed in a butt of cold water, and allowed to remain for ten days; at the expiration of the above time it was removed, and its elasticity, pliability, strength, and length, were found to be the same as when first put into the water. Caoutchouc, or India-rubber, by itself becomes very hard when exposed to the atmospheric air, or when immersed in cold water for any time; but this change does not take place when it is interlaced or combined in any way with good hempen thread—the rigidity is prevented, its elasticity is preserved, and its pliability remains. Perhaps Many-points was not aware of this fact.

Hoping the above brief statement of facts will satisfy Many-points, as well as your numerous readers,

I am, Mr. Editor,

Yours respectfully,

NAUTICUS.

March 28, 1837.

From the London Mechanics' Magazine.

PRACTICAL REMARKS ON KEEPING BEES.

Sir,—Having been requested by some person desirous of keeping bees, to give, through the medium of the *Mechanics' Magazine*, my opinion as to the best method of managing these useful insects, I beg to solicit the favor of the following observations being inserted.

I have kept bees nearly twenty years, and practised various plans with a view to gain the greatest produce in honey and wax with the least trouble, but more particularly with a view to the preserving the lives of the bees, and feel confident that the story-fying system, which I believe Wildman practised, is the best. I tried for six or eight years the plan Mr. Nutt advocated, which, by-the-bye, is as old as any of the plans known, but without meeting with any thing like the success of the common cottage hive. A strong stock in the latter had produced me an early swarm and cast, the swarm producing in a good season upwards of forty pounds of honey, and the cast fifteen pounds, the stock being kept five or six years. The honey thus procured is always of good color, and

fit for sale; and when after six seasons the parent stock is destroyed. the honey, being dark, may be used to make meed, or sweeten wine with, a strong swarm being kept to supply its place. This plan requires the destruction of the bees, and is therefore censured as inhuman; but to me is not more so than destroying beavers and cats for their skins, or catching fish to manure the land with; the consumer never considering how produce is procured, and should, therefore, be considered the most culpable, if such acts are breaches of humanity. The hives I now prefer are flat, having wooden tops fixed on with wires. The inside should be twelve or thirteen inches clear, and about seven inches high, the top having a centre hole, and three or four others round it near the outside, each hole being two or three inches diameter, and fitted with nice bungs. If no swarms are wanted, a large glass, or small straw hive, may be put on the top about the end of March, or a small glass to each hole, previously pulling out the bungs, gently turning them round first, each glass having a bit of paper pasted on it, stating its weight when empty; such glasses being kept from the light, by an empty hive being placed over them. Every ten or twelve days they should be examined, and when filled may be removed, and others put on, as long as the season permits. If a stock is weak, a new swarm or a cast may be put on the top of it, and the entrance closed till eight or nine o'clock the following night. These stocks may be preserved seven or eight years, but should be kept in a house or shed; and when the winter begins, the bungs having been replaced, should be covered over with sacking or other warm articles. Glasses may be put on a swarm immediately after hiving them, removing them in three or four weeks, to enable the bees to procure enough for the winter. The boards above mentioned should be made of pine plank, half an inch thick. The bottom boards should be made of the same, one inch or one inch and a half thick, having a piece projecting for the bees to light upon. By pursuing this plan, any number of stocks may be kept with but little trouble, and the bees saved; but the placing the glasses on empty hive early, is essentially necessary.

I am, Sir,
Your obedient servant,
G. L. Smartt.

Enfield, Feb. 10, 1837.

Fuel.—A cord of dry wood of any kind, contains the same quantity of carbonaceous or combustible matter, as a cord of green wood; and in the combustion of the green wood, a large proportion of the heat produced, is employed to convert the sap into vapor, where it becomes latent, and is lost.

Dry hickory is cheaper at four dollars a load, than dry white wood at two dollars. The following table shows the comparative value of different kinds of fire-wood, as ascertained by the experiments of Mr. Bull of Philadelphia. It should be remarked, however, that the Oak of Pennsylvania is more compact, and makes better fuel than the Oak of Michigan, at least this part of Michigan. Our maple too, is a heavier wood, and makes better fuel than the white ash.

	Pounds per cord.	Per cent of comparative value.
Hickory	4460	100
Pignut	4241	95
Chesnut Oak	3955	85
White Oak	3821	81
Red Oak	3254	69
Yellow Oak	2919	60
White Ash	3450	77
Black Birch	3115	63
White Birch	2369	48
Rock Maple	2878	60
White Maple	2668	54
Yellow Pine	2463	53
Pitch Pine	1904	84
White Pine	1862	34

[Michigan paper.]

Railways in London.—The extension of the Birmingham Railway, from the originally intended terminus at Camden-town to Euston-grove, near the New-road, is progressing rapidly, and the scaffolding is erected for the stupendous portico, which is to be composed of six columns, of the enormous height of forty feet, and proportionable thickness! The railway crosses the Hampstead-road and Park-street (leading to the east gate of the Regent's-park,) in an excavation of the depth of from twenty to thirty feet, although, at no great distance, it is carried over the Regent's canal at a height sufficient to allow the passage of barges below. The London Grand Junction Railway, which is to leave the Birmingham at its original terminus, and

carry on the line to the verge of the City, has also been commenced with considerable spirit, nearly at the back of Messrs. Cubit's, the contractor, in Gray's-Inn road. It is, at that part, at least, to be carried on arches, after the fashion of the Greenwich Railway, and very little progress can be made in the line either way, from the present site of operations, without pulling down houses and buildings of very modern erection. Its course will, in general, follow that of the *celebrated* River Fleet, whose channel, which within a short time saw "the light of day" in that vicinity, is now covered over there, as well as in most other parts watered by its "translucent streams."

From the Baltimore Farmer and Gardener.

A NEW MOTIVE POWER.

BALTIMORE, April 8, 1837.

MR. ROBERTS— When I stated to you the fact of an intimate acquaintance of mine having constructed a machine of almost unlimited propelling power on the Hydrostatic principle, you were so much pleased with the account as to request a communication from me for insertion in your periodical; with that request I cheerfully comply.

The inventor of this wonderful and useful machine is Mr. Theophilus Corbyne, an eminent vetinarian—a native of Scotland, and now residing in Pittsburg, Pa., who while practising his profession, has for the last seven years employed his leisure hours on this subject and has now the satisfaction of seeing his plan matured by having constructed one of twelve horse power, which comes fully up to his most sanguine expectations.

This machine he calls CORBYNE'S HYDROSTATIC PROPELLING MACHINE. In its construction it is too simple to admit of improvement, and as no steam nor heat of any kind is used in its operation, there can be no explosion, therefore in its use life is safe; and should any part break, it is by its simple construction, admirable of speedy repair.

It is applicable to the plough,* and all propelling purposes, and as such it must supersede the use of steam.

A machine of 500 horse power can be worked by one man, and neither its weight or the room required, will be more than one-tenth of the steam engine.

We of the present age, entered on a new era when Fulton brought forth his extended scheme in the application of steam to the propelling of boats on water—in which smoke and vapor supplied the place of canvass. The same age is now bringing forth another era in a more useful and extended scale of operation in this discovery of my friend, who is a philosopher and philanthropist in every sense of those terms.

Although our profession has for several years made us intimately acquainted, visiting each other, and conversing freely, for mutual benefit in our profession—yet true philosopher like, he never intimated to me that he was studying the subject, until on his way to Washington, he called on me and showed the model, which is now in the Patent Office.

With my respects, I am, yours, truly,

JOHN HASLAM.

* The inventor is fully under the impression that a plough constructed on the principles of his machine, will be competent to plough 100 acres of ground a day.

THE IMPORTANCE OF TIME KEEPING.— The topography of watch-making, at home and abroad, would present a vast number of curious and interesting facts.— In consequence of the minute subdivision of labor in this trade, it is said that there are only three places in the United Kingdom where a complete watch can be manufactured,—London, Liverpool and Coventry. The business has been introduced at the latter place entirely since the year 1800, and the number of persons employed in it there is now supposed to equal the number in the metropolis.

ON THE CALCINATION OF ORES.

A most simple method for effecting this process is practised at the Iron works in Staffordshire, as well as at some of those in Scotland and Wales. It consists in spreading the ironstone intended for calcination over a bed of coal about a foot in thickness, adding occasionally a layer of small coal, until a heap is raised about eight or ten feet in height, and fourteen or fifteen in diameter; the fire is then lighed, and the operation left to itself without any further attention. The open fires vary, however, in their form. Another, and more economi-

cal mode is used in South Wales, by which the refuse coal and coke are consumed in ovens or kilns, constructed for the purpose.

The form of the interior is, usually, a reversed cone or pyramid; those which approach to an oval being also held in much esteem. The oven, or kiln, being first charged with coal and ironstone, but not entirely filling it, when the fire begins to reach the upper part, small coal is thrown on alternately with the ores, until the kiln is filled. The lower part is then drawn out and left to cool, as in lime burning; the kiln is recharged, and the process continued indefinitely.

In Wales it is generally contrived to erect the blast furnaces on the side of a hill and the calcining ovens are built on a terrace surrounding it, to the height of the furnace mouth: the time for the operation is regulated so as to keep a supply only to the quantity required for smelting. At Newcastle-on-Tyne a similar method is practised, but the fuel consists of small coke.

At Bradford the ovens are rectangular, and about twenty-five feet in depth, fourteen long, and five wide, in the upper part; towards the middle it takes the form of a truncated pyramid, whose base is about twenty inches diameter: small coke is used here also: at other works in the same vicinity the ovens are of a similar shape to the furnaces, and about fifteen feet in height.—These dimensions are, however, exceedingly variable, both in different counties, and sometimes in the same establishment.

At Pouldice, in Cornwall, the tin ores are roasted, to facilitate the subsequent separation by washing. The furnaces for this purpose have a fire place about one foot by four feet, on the same level as the part destined for the ores, and only separated from it by a course of bricks placed flat, the furnace bed is about nine feet six inches by eight feet; the height of the roof one foot; its course nearly horizontal. In the front of the arch, near the door, is a vent, which, after rising vertically, takes a course nearly horizontal, and discharges itself at the distance of a quarter of a mile into a large chimney, the upper part is formed of flat stones, which are easily removed for the purpose of clearing out the arsenic accumulated on its sides, which is sold for 10s per ton: on the outside of the furnace is, also, a projecting or forge chimney, rising about fifteen feet. Similar precautions, favorable to the health of the workman, are in use in all the tin works throughout England, which have not yet been introduced into Germany. The charge of this furnace is six cwt., requiring 1½ bushels of charcoal to each roasting; this is, however variable, as well as the duration of the process, according to the nature of the mineral acted upon.—[Lond. Quar. Mining Review.]

MEMOIR ON THE CALCINATION OF COKE.

Abridged from the Report, by Messrs. Perdonnet and Leon Coste, in the Annales des Mines.

Coke is obtained in England by two distinct processes; in the open air, and by means of ovens constructed for the purpose. The former is the method usually adopted, the latter being applied almost exclusively to the small coal or slack. In the vicinity of Dudley, in Staffordshire, all the coke is made in the open air; the process consists in forming a small conical chimney, with bricks placed in such a manner as to leave spaces between them, these openings are larger in the lower than in the upper courses, the usual height is about four feet six inches, surmounted by a cylinder of one foot. The coal is then disposed around the chimney, the largest lumps being placed first to form the base of a cone, after which more is thrown on the heap, until the top is above the level of the brick work; the whole surface is then covered with slack, with the exception of the lowest part of the heap, to about one foot high, the fire is then lighted in the chimney at a certain period of the operation the remaining part is also covered with slack, and when the carbonization is judged to be complete the fire is extinguished, by throwing on a sufficient quantity of water and dispersing the materials of the heap.

The dimensions of the coke heaps vary considerably, they are most commonly fourteen or sixteen feet in diameter, and contain about twelve ton of coal. From the time of lighting the pile the operation is completed in seven days, three for the calcination and four for the extinction and subsequent cooling of the mass.

It would appear that a method so simple as this would be invariable in the results,

nevertheless the contrary is the fact, much depending on the attention and judgment of the burner or superintendant. A ton of coal usually yields twelve cwt. of coke, or sixty per cent. sometimes ten cwt. or fifty per cent. from the same materials. In South Wales both methods are practised, but the coke is not calcined with so much attention as in Staffordshire, the process differs in the heap being made in the form of a long bank four to six feet in breadth, and about three feet high, the l rge coals in the middle, and the fire being lighted either at one end or at several parts of the heap. At Pontypool and Abergaveny the coke is calcined in the open air; the coal in some parts of this district bears a resemblance to charcoal, in converting it into coke great care is taken to preserve this entire, the operation is completed in five days. In the neighborhood of Merthyr Tidvill the process is conducted in the open air, and although very little care seems to be given to its progress, yet a considerable quantity of coke is produced, the coal being generally dry and giving but little smoke. At Plymouth works six tons of coal yield five tons of coke; at Dowlay 720 lbs. of coal yield from 450 to 500 lbs. of coke; at Pen-y-Darran the operation lasts only three days, the increase in bulk being also very considerable, three tons of coal producing twelve barrows of coke, each containing seventeen cubic feet, or above one-fourth part more than previous to calcination.

At Neath Abbey the carbonization is more rapid than in any other place, it being finished in nine hours, producing rather less than sixty per cent. of coke. In Scotland calcination in the open air is generally adopted; formerly the heaps were burned without much attention being paid to their progress, but the Staffordshire mode has been used latterly with great advantage, the heaps consisting of eighteen tons of coal, well covered with slack, kept burning three or four days, and four or five days more being allowed for the cooling of the mass, the loss in weight is about fifty per cent.; the old method occupied only five days, but the loss amounted to from sixty to sixty-six per cent. The coke is of very unequal quality, some parts being very heavy and others light and porous. In Yorkshire the coal is arranged in long banks six feet wide by two and a half high, with square vertical chimneys, eight or nine inches in diameter, formed with large coals, at about the distance of six feet from each other throughout the length; the loss is about fifty per cent. in weight.

Calcination in ovens is considered to produce a heavier coke than the open calcination; the process varies but little, being in all cases performed in ovens of a circular or oval form, with a low arch surmounted with a small chimney, the furnace has two doors or openings opposite to each other, sliding in a groove and raised by a lever, they are usually of cast iron, the dimension of the furnace about twelve feet by six; height of the arch in the centre five feet, at the door twenty-one inches; the chimney rises three feet externally and about nine inches in diameter. At Neath Abbey the furnaces are smaller; the chimney is eighteen inches externally, and only one door, but in this case a hole is made in the opposite side to facilitate the clearing out of the coke. From the small coal carbonized in this manner the produce is about sixty per cent. while the same quantity of coal in the open air yields but fifty per cent. the coke from the furnace being so much more dense. At Swansea, by the same process, the produce is about fifty-four per cent.

In the vicinity of Glasgow a circular oven with one door is in use, the diameter is nine feet, height of the arch six feet.—The coke is drawn out every twenty-four hours; the ordinary charge, one ton and a half of coal, rising about two and a half feet in the oven, the loss is from fifty to sixty per cent. On Saturdays the charge is increased to two tons, and is not withdrawn until the Monday. At the Lymington works, near Newcastle-upon-Tyne, all the coke is made in ovens, the usual charge is one chaldron of about two and a half tons, the operation lasts forty-eight hours, and the average loss thirty-nine per cent. The coke is screened to the diameter of about one inch, for smelting in the high furnace, the smaller portion being employed in roasting the ores. At Bradford, in Yorkshire, the method is similar to Newcastle, but the furnaces are smaller, the charge being only about one ton, the loss is about forty per cent. It is difficult to decide to which process a preference ought to be given, the loss is less in the ovens, but they require more

space, more attendants, and more expense, while the open carbonization is considered to yield coke better adapted for smelting in the high furnace.—[Lond. Quar. Mining Review.]

Items.

Egyptian Antiquities.—At the close of a series of lectures on Egyptian Antiquities, lately delivered at Exeter Hall, by Mr. Pettigrew, that gentleman unrolled a mummy, which had been presented for the occasion by Mr. Jones, of the Admiralty. This operation excited a marked feeling throughout the whole of the numerous auditory, including many individuals of distinction in the literary circles. In the commencement, Mr. Pettigrew noticed that the inscription on the outer case differed from that on the inner case containing the mummy. Both stated the party to have been a female; but the names and genealogies were different, and the latter stated the mother of the deceased to be living when her daughter died. It might be that the wrappings would settle the point; which, however, they did not, for no name was found on them, as often occurs. The mummy was Greco-Egyptian, and embalmed after the ancient manner—the bowels being extracted by an incision on the left flank, and the brains, probably, through the nostrils as the nose was much broken. The legs were separately bandaged, and the ankles bound by stripes of painted linen, about half an inch in breadth. The figures were not hieroglyphic, but simply ornamental.—Bands of the same kind surrounded the arms, which were crossed upon the breast; and a similar circle went round the neck. On each knee was a thin piece of gold, resembling the lotus flower; over each eye the providential eye of Osiris, of the same material; and another golden ornament upon the top of the ridge of the nose. There were rings on the fingers; but the opportunity was not sufficient for examining them, nor time for proceeding to the careful and laborious unrolling of the body to the end. The upper wrappers were not voluminous, and of coarse nankeen colored linen. Then came a complete envelope of asphaltus, and below that, the usual disposition and extent of linen rolls. On the soles of the feet were slight sandals, transversely striped black, white, and red, exactly like those painted on the bottom of the inner case. The finger and toe nails were gilt; and, altogether, the subject presented many objects for further investigation and study.—[Literary Gazette.]

Cultivation of Filberts.—Sir, in consideration of the periodical return of the season for trying the merits of the suggestion I inserted in your number 183, just 10 years ago, for improving the crop of filberts, and as I have reason to believe from my own and other's subsequent experience, that my idea is well founded, you will perhaps allow the re-appearance of the following:—"In countries where figs are cultivated to the greatest perfection, particularly in Italy and Greece, a great augmentation, both in the size and number of the figs, is obtained by placing on the top of the tree a branch of the wild fig-tree (*Caprificus*), upon which have appeared male-flowered figs, which are the first to come forth. I have often thought, that the crop of filberts might be both ameliorated and increased, by a somewhat analogous application of a branch of the common hazle, when covered with the 'cat-kins' or flowers. This is just the time to try the experiment." I hope that some of your correspondents who have the opportunity, will try and report upon the experiment. Besides the increase of the pollen, it may have an effect like the recurring to the original stock by grafting or seed, as with apples and some other fruit-trees. Filbert-trees are often deficient in male flowers.—Yours, &c., F. Maceroni.

Extraordinary Draught by One Horse.

The following extraordinary feat of a draft horse has been recorded. Soon after the completion of the Surrey Iron Railway, and when it was open for the conveyance of goods from Wandsworth to Mertsham, a bet was made, that a common horse could draw thirty-six tons for six miles along this road, and that he should commence his labor with a dead pull, as well as turn it round the occasional windings of the road. A number of persons assembled near Mertsham to witness the performance. Twelve wagons loaded with stones, each wagon weighing three tons, were linked together, and a horse taken from a timber team of Mr. Harwood was hooked to th first wagon He started from near the Fox public house, and drew this immense weight

with apparent ease, to near the turnpike at Croydon, a distance of six miles, in one hour and forty-one minutes. In the course of his journey, he was stopped four times, in order to show that it was not by the acquired impetus that he performed the task. After each stoppage, a chain of four wagons was added to the train, with which the same horse set off again without difficulty, even after about fifty men had mounted them.—[Far. Mag.]

THE THAMES TUNNEL.—According to the Report of the Directors at the last meeting of the Thames Tunnel proprietors, the "great bore" has been driven *one hundred and thirty feet* nearer the Middlesex shore since the works recommenced, so that in a short time it is anticipated the lower-water-mark on the Wapping side will be reached, and the completion of the undertaking made a matter of comparative certainty.

A NEW CONSTRUCTION OF RAILWAYS.

M. Perkins has just exhibited a new plan of railways, which he has secured by patent, and which from the explanation given by him, would appear calculated to supply the desideratum so long desired, and indeed appears to form an era in the progress of those great national undertakings towards perfection.

The plan embraces two modes of construction, founded on one common principle, viz. the continuous support of the rails In the one case this is effected by blocks of vitrified earth, as hard and durable as granite, and which lock into one another, being laid on a concrete foundation: and in the other, by an additional depth of concrete supplying the place of sleepers altogether. Upon the former plan, wooden bearers, four inches in the base, four thick, and two wide, on the top, rest upon the vitrified blocks; and in the latter, upon the concrete, to which they are firmly secured.—In both cases, iron bars, with the means afforded for expansion and contraction, are fixed on the wooden beams, and the foundation being continuous and solid, in fact like one block of granite the whole length of the road, no vibration is felt, as the numerous persons who rode in the wagon unanimously testified; and this is an important attainment in railway constructions. The saving by the plan first described will, it is stated, be full £4000 per mile, in four rows: and by the latter, very much more—in fact so enormous will it be, as to give a new feature to railways, and astonishingly facilitate their construction in all parts of the country. We should much like to see it in practice, which is alone the test: so fallacious are frequently found to be the results when based alone on novelty and experiments.—[Mining Journal.]

MORE RAILROADS.—The Lockport Balance states that the Railroad between Lockport and Niagara Falls commences operation immediately—cars running twice a day each way. The Railroad between Niagara Falls and Buffalo, is put in good order for the season; and as there will be a Railroad from Lewiston to intersect the Lockport and Niagara Falls route, great facilities are offered for intercourse between several important points. In connexion with our Tonawanda Railroad, a track from Batavia to Buffalo or Lockport would give Rochester full enjoyment of the conveniences thereby afforded.—[Rochester Republican.]

IMPROVED RAILWAY.—We have seen models of improvements in the construction of Railroads, made by our townsman, Isaac Cooper. So far as we are capable of judging we give our most decided approbation of the Plan. The objects proposed to be accomplished by Mr. Cooper on his new plan, are cheapness of construction, security against lateral pressure, facility of repairing, and durability of this material, and we think those objects are all attained.

Mr. Cooper has applied for a patent and has now in preparation a full description of his improvements, which will be published in a few days. We refer to this and to his models, as the best means of acquiring a knowledge of the plan.—[Ebensburg Sky.]

MECHANICS' MAGAZINE AND JOURNAL OF MECHANICS' INSTITUTE,—Published by D. K. Minor, and G. C. Schaeffer, No. 30 Wall-st. Basement story, at $3 per annum in advance.

ALSO,—Published at the same place the RAILROAD JOURNAL at $5 a year.

The New-York FARMER and GARDENERS' MAGAZINE, at $3 a year; both in advance.